I CLAIM:

1. A flush valve including a body having an inlet and an outlet, a main seat assembly at said outlet, an outer cover attached to the body, an inner cover attached to the body within the outer cover, a piston movable within the body and inner cover, the piston and the inner cover defining a pressure chamber, an exterior seal carried by the piston and bearing against an inside wall of the inner cover during movement of the piston, a refill orifice in the piston connecting the pressure chamber with the body inlet, pressure in the pressure chamber maintaining the piston closed upon the main seat assembly, a relief valve in the piston for venting the pressure chamber to the outlet, and an actuator mounted in the body and selectably engageable with the relief valve to vent the pressure chamber causing the piston to move away from the main seat assembly.

2. The flush valve of claim 1 wherein the inner cover rests on a portion of the body and is held thereon by the outer cover.

3. The flush valve of claim 2 wherein the inner cover has a plurality of exterior centering ribs on a portion thereof, which ribs engage an inside surface of the body.

4. The flush valve of claim 2 wherein the portion of the body upon which the inner cover rests is an inwardly-directed ledge, the inner cover having an outwardly-directed flange which rests upon the inwardly-directed ledge of the body.

5. The flush valve of claim 4 further including a peripheral seal between an underside of

the flange of the inner cover and an upper side of the ledge of the body to form a seal between the inner cover and the body.

6. The flush valve of claim 5 further including a recess in the underside of the flange of the inner cover, said peripheral seal being positioned within the recess.

7. The flush valve of claim 5 wherein the outer cover has a portion thereof clamping downwardly on an upper side of the inner cover's outwardly-directed flange.

8. The flush valve of claim 1 further including a projection on an inside surface of the inner cover, the projection being engageable with the piston to limit upward movement of the piston.

9. The flush valve of claim 8 wherein the inner cover includes a top, the top including a ring extending from the top toward the outer cover.

10. The flush valve of claim 8 wherein the inside surface of the inner cover further comprises a plurality of reinforcing ribs.

11. The flush valve of claim 9 wherein the inner cover top is domed.

12. The flush valve of claim 1 wherein the inner cover has a top, the top being domed,

and the top having a ring directed toward the inside of the outer cover to limit movement of the inner cover during pressure conditions in the pressure chamber.

13. The flush valve of claim 12 wherein the ring is annular.

14. The flush valve of claim 1 wherein the inner cover has an inner surface with a surface texture of on the order of about 8 microinches to about 32 microinches.

15. A flush valve including a body having an inlet and an outlet, a main seat assembly at the outlet, an outer cover attached to the body by threads, an inner cover attached to the body within the outer cover and in sealing engagement with the body to isolate the outer cover threads from contact with water, a piston movable within the body and inner cover, the piston and the inner cover defining a pressure chamber, an exterior seal carried by the piston and bearing against an inside wall of the inner cover during movement of the piston, a refill orifice in the piston connecting the pressure chamber with the body inlet, pressure in the pressure chamber maintaining the piston closed upon the main seat assembly, a relief valve in the piston for venting the pressure chamber to the outlet, and an actuator mounted in the body and selectably engageable with the relief valve to vent the pressure chamber causing the piston to move away from the main seat assembly.

16. The flush valve of claim 15 wherein the body includes an inwardly-directed ledge and the inner cover includes an outwardly-directed flange which rests upon the inwardly-directed

ledge of the body.

17. The flush valve of claim 16 further including a peripheral seal between an underside of the flange of the inner cover and an upper side of the ledge of the body to form said sealing engagement between the inner cover and the body.

18. The flush valve of claim 17 further including a recess in the underside of the flange of the inner cover, said peripheral seal being positioned within the recess.

19. The flush valve of claim 17 wherein the outer cover has a portion thereof clamping downwardly on an upper side of the inner cover's outwardly-directed flange.

20. The flush valve of claim 15 further including a projection on an inside surface of the inner cover, the projection being engageable with the piston to limit upward movement of the piston.

21. The flush valve of claim 20 wherein the inner cover includes a top, the top including a ring extending from the top toward the outer cover.

22. The flush valve of claim 20 wherein the inside surface of the inner cover further comprises a plurality of reinforcing ribs.

23. The flush valve of claim 21 wherein the inner cover top is domed.

24. The flush valve of claim 15 wherein the inner cover has a top, the top being domed, and the top having a ring directed toward the inside of the outer cover to limit movement of the inner cover during pressure conditions in the pressure chamber.

25. The flush valve of claim 24 wherein the ring is annular.

26. The flush valve of claim 15 wherein the inner cover has an inner surface with a surface texture of on the order of about 8 microinches to about 32 microinches.

27. A flush valve including a body having an inlet and an outlet, a main seat assembly at said outlet, the main seat assembly having a cylindrical portion which engages an inside surface of the body to center an opening of the main seat assembly, an outer cover attached to the body, an inner cover attached to the body within the outer cover, the inner cover having a plurality of exterior centering ribs on a portion thereof, which ribs engage an inside axial surface of the body to center an inside wall of the inner cover, a piston movable within the body and inner cover, the piston having a skirt engageable within the main seat assembly opening to center the piston, the piston and the inner cover defining a pressure chamber, an exterior seal carried by the piston and bearing against said inside wall of the inner cover during movement of the piston, a refill orifice in the piston connecting the pressure chamber with the body inlet, pressure in the pressure chamber maintaining the piston closed upon the main seat assembly, a relief valve in the piston

for venting the pressure chamber to the outlet, and an actuator mounted in the body and selectably engageable with the relief valve to vent the pressure chamber causing the piston to move away from the main seat assembly.

28. The flush valve of claim 27 wherein the inner cover rests on a portion of the body and is held thereon by the outer cover.

29. The flush valve of claim 28 wherein the portion of the body upon which the inner cover rests is an inwardly-directed ledge, the inner cover having an outwardly-directed flange which rests upon the inwardly-directed ledge of the body.

30. The flush valve of claim 29 further including a peripheral seal between an underside of the flange of the inner cover and an upper side of the ledge of the body to form a seal between the inner cover and the body.

31. The flush valve of claim 30 further including a recess in the underside of the flange of the inner cover, said peripheral seal being positioned within the recess.

32. The flush valve of claim 30 wherein the outer cover has a portion thereof clamping downwardly on an upper side of the inner cover's outwardly-directed flange.